1.0 INTRODUCTION

A dam safety inspection program is essential to the long-term stability and safety of a dam and should be part of every dam operation plan. The purpose of the inspection program is to evaluate the structural and operational aspects of the dam, to identify and resolve problems, and to verify that the component parts are functioning properly. An effective inspection program plays an important role in dam ownership and can protect the downstream interests and owner against financial and legal liabilities that can result from dam failures. The inspections should be scheduled and performed on a regular basis. Inspection and maintenance of dams are critical to their long-term performance. However, it should be stressed that inspections alone do not make dams safe; timely repairs and maintenance are essential to the safe operation of every dam.

This part (Part 3) of the Indiana Dam Safety Inspection Manual provides recommended procedures for completing and documenting a dam inspection. The term "inspection," as used in this manual, includes the entire evaluation process, consisting of a project file or data review, a field examination (visual inspection), and report preparation. Depending on current regulatory requirements, the report may need to be submitted to the Indiana Department of Natural Resources (IDNR). The different types of inspections are discussed in Chapter 2.0.

Personnel that perform dam inspections must be knowledgeable in dam design, construction, and operation to effectively evaluate the dam conditions. The inspector should be an experienced, or trained, dam safety professional with expertise in the technical issues encountered at the dam. For instance, the inspector must have knowledge or expertise in structures if the dam has a significant concrete spillway structure, or knowledge or expertise in soils and geotechnical engineering if the dam has an earth embankment (see Figure 1-1). This is especially important if these structures have known problems that need evaluation and repair. The importance of proper inspector training and expertise cannot be overemphasized; the dam owner is not doing himself (or herself) any favors by using unqualified inspectors. A good analogy of this can be found in everybody's personal home life. A responsible homeowner would not hire a landscaper to perform inspections of the heating or plumbing systems in the house, so why would a responsible dam owner hire someone without proper dam expertise to perform an inspection of a dam? The recommended members and expertise of an appropriate inspection team are discussed in Chapter 3.0.

Figure 1-1 Knowledge of concrete and earth structures is required here.

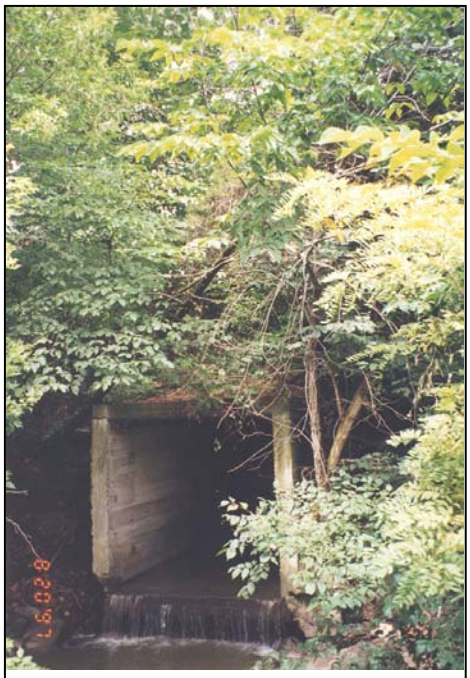

Figure 1-2 Excessive vegetation on this dam embankment makes visual inspection very difficult or impossible.

Inspection personnel must report dam conditions accurately and thoroughly to protect the dam owner's interests and to minimize potential liabilities of both the dam owner and the inspector. Inspectors may be held liable and accountable for dam failures resulting from unreported or understated conditions and problems. It is important for inspectors to document any limitations of their inspection. For example, deficiencies or problems may not be readily detectable at some dams if excessive vegetation is present, if access to certain features is not possible, or if there are problems within the embankment or under a structure that cannot be seen. The inspector is not representing the dam owner's or his/her best interests by overlooking problems at a dam to minimize owner costs or regulatory exposure. Therefore, it is very important that all inspectors develop an unbiased approach to inspections and provide a complete and accurate reporting of existing conditions. If an inspector changes the safety rating of the dam or one of its components from prior ratings, substantive documentation should be provided to support the change. Chapter 4.0 provides details on inspection procedures and documentation.

The Indiana Department of Natural Resources (IDNR) currently classifies dams into one of three categories of hazard classification. A hazard classification is a rating (e.g., low, significant, or high hazard) that is representative of the probable loss of life and property damage downstream from a dam based on the best available information and visual observation of the dam, and/or an identification of the area downstream that would be inundated. The following definitions of hazard classification currently apply to dams in Indiana:

(1) **High hazard dam**: a structure the failure of which may cause the loss of life and serious damage to homes, industrial and commercial buildings, public utilities, major highways, or railroads.

(2) **Significant hazard dam**: a structure the failure of which may damage isolated homes and highways, or cause the temporary interruption of public utility services.

(3) **Low hazard dam**: a structure the failure of which may damage farm buildings, agricultural land, or local roads.

This manual provides guidance for performing safety inspections for all three classes of dams. Dam owners should refer to current IDNR regulations to determine the specific inspection, reporting, and inspector training requirements for their dams. This manual is

intended to provide a guide and reference to all individuals performing and reporting dam safety inspections. Chapters 5 through 8 provide a quick reference to be used in assessing observed conditions, their probable cause and possible consequences, and remedial actions that may solve the observed problems or deficiencies. The dam owner or inspector can use the results of inspections to help identify any changes in previously noted conditions that may indicate a safety concern. Quick corrective action to conditions requiring attention will promote the safety and extend the useful life of the dam while possibly preventing costly future repairs (see Figure 1-3).

Figure 1-3 Dam breach failures cause significant downstream damage.